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Wilderness BOATING

On Yellowstone Lakes

WILDERNESS BOATING ON YELLOWSTONE LAKES

by

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TABLE OF CONTENTS

	Page
Foreword	
Map of Yellowstone and Shoshone Lakes . . . . . Facing	1
Introduction	1
Equipment	3
Canoes	3
Sketch of Canoes and Paddles	7
Paddles	8
Other Equipment	9
Technique of Canoe Travel	10
Transporting Canoe	10
Trimming Canoe	10
Landing and Embarking	11
Paddling	12
Map of Upper Yellowstone Lake	14-15
Travel Conditions	16
Wilderness Canoe Trips to Upper Yellowstone Lake and Shoshone Lake	18
Flat Mountain Arm	20
South Arm	21
Southeast Arm	22
Map of Shoshone and Lewis Lakes	24
Shoshone Lake	25
Safety	26
Summary	28
Wilderness and You	29

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FOREWORD

John Montagne knows wilderness and canoes, knows them well. He gained his knowledge the only way a man can through years of experience. He has climbed the rugged Tetons, and the lonely wilderness of the Absarokas and Beartooth Plateau is no stranger to him. John has also explored the water wilderness of upper Yellowstone Lake and pointed the bow of his canoe at most of its points of interest.

With the limitation of Shoshone Lake and Yellowtone Lake's South, Southeast, and Flat Mountain Arms to hand propelled boats, we of the National Park Service felt the definite need for informational literature. Many park visitors would want to know about the areas before visiting them. We knew there was one man who could best meet this need; we asked him, and this booklet is the result.

I know you will enjoy reading what Dr. Montagne has to say. His ideas are well thought out, are well expressed, and he knows what he is talking about; whether you have a canoe or a rowboat, you will find much here to help you. Follow his advice and you are sure to have a memorable wilderness adventure. A safe one, too.

Lemuel A. Garrison
Superintendent

CANYON
NORRIS
GRAND
WEST ENTRANCE
MADISON JCT.
LAKE
FISHING BRIDGE
CONTINENTAL DIVIDE
OLD FAITHFUL
WEST THUMB
YELLOWSTONE LAKE
EAST ENTRANCE
SHOSHONE LAKE
LEWIS LAKE
HEART LAKE

INTRODUCTION

The National Park Service, in a fitting but controversial move, has zoned the waters of upper Yellowstone Lake and Shoshone Lake for the exclusive use of persons in hand-propelled boats. Not only will this measure help guarantee the perpetuation of wildlife in these great areas, but it also assures the average citizen, young and old, of an opportunity for enjoying the pleasures of a true wilderness trip. The unfortunate and illusive fact is that few places remain where one can leave the ruckus of mechanized environment, and it is up to the people who appreciate the Yellowstone wilderness to perpetuate it through proper use. In keeping with our current national drive for physical fitness, the rugged type of wilderness experience is an excellent means for toning up in the days ahead. Let's take a look and see what it's all about!

My story is centered mostly about the canoe as a means to enjoy the Yellowstone, but this craft is by no means the only one feasible for this area, albeit my favorite.

The canoe has been passed down to us in essentially its present design by the American Indian, and the lore, the means whereby it is paddled, its delicate sensitivity, all contribute to a certain fascination. One can hardly step into one without developing a lasting curiosity, and, we hope, the ability to prevent a quick ducking. But what of the complaint that the canoe is a dangerous craft, that unusual skill is required in its operation, that those who use it must be endowed with a generous time-off schedule in which to struggle along the shores of these lakes? The subsequent pages should indicate the fallacies of these admonitions.

As descendents from wilderness creatures, I think that we thrive on a taste of the natural flavor. The challenge of real adventure coupled with the coordinated use of our own physical abilities is truly a lasting satisfaction and tonic.

We hear rumors that the National Park Service is dedicated to the exclusion of people from the sanctuaries over which they rule!

Actually, nothing could be further from the truth, and in the case of the Yellowstone Lake wilderness, the Service is dedicated to letting us have our cake and eat it too. This takes skill, and what's more, it takes cooperation on the part of all concerned, for let us not forget that wilderness is delicate and cannot exist where man or his devices dominate. Reasonable requests on the part of the visitor will be answered by reasonable permissions, and perhaps the pages that follow will open up some ideas for you. The information in this pamphlet is not intended to be so explicit that the thrill of adventure into the unknown will be removed.

EQUIPMENT

CANOES

There are canoes and there are canoes. Although essentially unchanged in outward appearance since the American Indian first paddled his birchbark along the waterways of North America, there is a vast difference in the behavior and safety features of various models of this craft. The primary advantages of the canoes as a means of wilderness travel lies in the speed, agility, and "carry through" under the paddle stroke, and the quietness and ease with which this is accomplished. An important objective is to incorporate the above characteristics in a boat which is also reasonably safe and capable of toting a moderate load. A blunt-end flatbottomed scow may be safe enough from the standpoint of tippiness, but it would be impractically sluggish to row or paddle. On the other hand a "rocker" shaped 16 foot canoe whose maximum width (beam) is less than 30 inches and whose ends taper to a mere wafer may well be fast and quiet, but it would keep its passengers constantly "on edge" for fear of being spilled. Naturally, then, a number of satisfactory compromises in design have been made which allow for a nominal amount of safety along with the other good attributes of the canoe.

The most practical and popular open canoes are currently made of aluminum, wood, or canvas-covered wood. Fibre glass canoes are also coming into their own, but current models are heavier than equivalent aluminum models and in some case, even the wood-canvas types. Each has advantages as well as disadvantages. In wooden or canvas-wood canoes, planking is usually of red cedar, ribs of white cedar, gunwhales of spruce or mahogany, and keel, stem, and decks of ash. Laminated wood hulls are successful, popular, and strong. Commercial manufacturers of these canoes stick to the long tapering shape fore and aft (frontward and rearward) from the center, although the tendency is to make canoes shorter than 16 feet in length slightly fuller in the ends. Perhaps the most popular utility canoe for the serious outdoorsman has been the "Guides Special" model promoted by the Maine canoe manufacturers. It has broad lines that give it steadiness and gen-

erous carrying capacity, and its flat floor carried far into the ends makes it maneuverable over very shallow places. The low ends which lessen wind resistance are very important considerations on Yellowstone Lake.

Contrary to most opinions, the purely wooden, or canvas-covered wooden canoe is easily repaired, temporarily or permanently. Temporary repairs are accomplished by melting tarry canoe glue with a candle and allowing the hot material to melt into the rip or hole. More permanent repairs are usually made by cementing a patch of canvas over the blemish by means of a combination of ambroid cement and white lead. If the hole is quite large, galvanized tacks can be driven through the canvas patch and clinched on the inside of the canoe through the wood. Repair kits containing the essentials are available through most canoe manufacturers. To some canoeists, part of canoe lore involves care and maintenance work, and many canoes last longer then fifty years in spite of a multitude of repairs. The important thing is to keep up the steady maintenance demanded of the wooden or wood-canvas canoe. Sun and salt water are deleterious to wood and canvas, no matter how carefully sealed, and it is always a good policy to store or park these boats in shady spots when out of water.

Some canvas and wood canoes are made with bulbous pontoons along the gunwhales which lessen tipping danger and add some to the utlimate buoyancy. This so-called "sponson" canoe is also quite heavy and unwieldy so that the feel of the craft is lost to safety, making it unacceptable to most canoeists as a wilderness craft.

Canvas and wood canoes always take on water with steady usage. The water gets between the planks and ribs, soaks up in the wood, and even seeps between the canvas and the planking. The effect is to increase the weight of the canoe slightly, but be it ever so slight, portaging becomes noticeably more onerous. But to many in spite of its maintenance requirements and its relative vulnerability, the wooden or canvas-wooden canoe is the only acceptable model because of the quietness and ease of its glide, its sleek lines, and its romantic tradition.

Most commercially manufactured aluminum canoes differ slightly in design and behavior from the wooden or wood-canvas models (see sketch). The Grumman variety is built fuller in both ends and has a broad flat bottom in both dimensions. The styrofoam safety flotation tanks beneath the bow and stern (front and back, see sketch) decks necessitate the comparatively wide blunt entry in 15 foot models, for the tanks must occupy the maximum volume without taking up much of the usable cargo and passenger space in the canoe. The fuller ends allow more cargo capacity and also tend to float the canoes upward beneath a wave more readily, but the bulbous shape makes the canoe behave slightly differently in the water. In most uses the average canoeist will not notice the difference, however. The aluminum canoe is somewhat lighter than the wood and canvas model, has slightly shallower draft, is more resistant to scrapes and other wear, and does not take on excess water when used for long periods of time. It follows that the aluminum canoe is easier to portage than a wood canoe of the same length. But the aluminum model lacks that certain smell and feel that the wood canoe enthusiast has learned to appreciate as part of canoe lore, and it is a bit noisy in the water when lightly loaded. Each to his own! My family and I have argued the case for hours but we have never completely resolved the differences, hence we have one canoe of each type in our larder. The following comparative figures and sketches speak for themselves:

Comparison of important dimensions of typical aluminum and wood-canvas canoes (figures obtained from manufacturers)

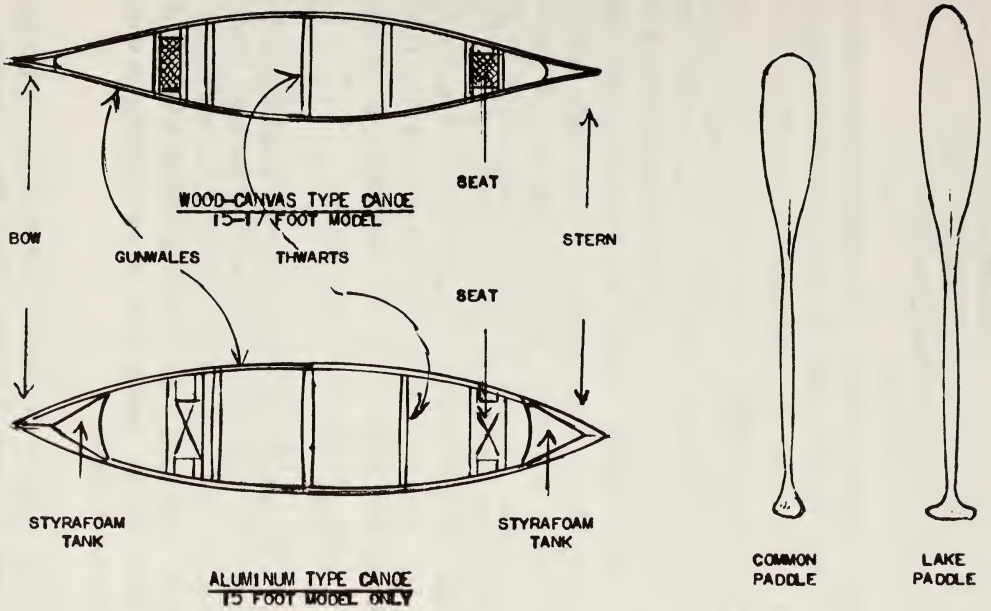
	18 foot aluminum canoe	18 foot wood-canvas canoe (Guides Model)
Weight:	86 lbs. (Lt. gauge-74 lbs.)	85 lbs.
Length:	216 3/4 in.	216 in.
Beam:	36 5/8 in.	36 in.
Depth:	13 1/8 in. (at center)	13 in.
Capacity:	1146 lbs. (with 6" freeboard amidship)	(figures not available)

	15 foot aluminum canoe	15 foot wood-canvas canoe (Guides Model)
Weight:	68 lbs. (Lt. gauge-53 lbs.)	58 lbs.
Length:	180 5/16 in.	180 in.
Beam:	35 1/8 in.	34½ in.
Depth:	12 1/8 in. (at center)	11 in.
Capacity:	890 lbs. (with 6" amidship)	(figures not available

General points which apply to all canoes may be pertinent here. It is generally agreed that the most suitable average length for all considerations is the 17 footer. Fifteen footers are easier to portage and may suffice for light loads and short mountain lake trips. Eighteen, or even 20 footers afford maximum stability and load capacity and would not be out of place on Yellowstone Lake; one can sit or stand on either gunwhale without capsizing them, but they do not have the delicate feel of the 17 footer.

The keel of a canoe is an important consideration. For lake travel, a keel that projects downward about 7/8ths of an inch is a definite advantage in preventing side drift and in helping the canoe to track. In white water, however, a stubby "shoe keel" is best as it will not hang on rocks and cause sideward drift under adverse currents.

If portaging is to be done, a center thwart is advisable but not necessary. In most cases it is possible to eliminate the bow thwart if the canoe has a bow seat to take the strain. If a 2-5 horsepower motor is necessary or desirable in unzoned areas, it is comparatively easy to make or buy a mounting bracket. Canoes also can be rowed with ease if provided with an outrigger mount for oarlocks, again available through commercial sources.



THE RELATIVE SHAPES OF TYPICAL CANOES AND PADDLES

PADDLES

The single paddle, made ideally of ash, maple, or cherry wood, is the traditional instrument for propelling the canoe. Spruce paddles may be satisfactory to the uninitiated but the softness of the wood necessitates a thicker, blunter blade which lacks the spring and life that thinner hardwood paddles have.

Like canoes, paddles differ in functional design (see sketch). Most people are familiar with the common wide bottom paddle, but few may realize that for lake travel, a longer narrower blade which gradually tapers toward the bottom is infinitely more pleasurable and less shocking to the muscular system. A good rule of thumb is that a paddle should stand eye or head height to the user. If the canoe is to be paddled from seats instead of from a kneeling position, the stern paddle should be proportionately longer (ie: about two inches) than the bow paddle since the stern seat puts one a bit higher above the water than the bow seat. In the writer's opinion, lake paddle blades should measure about 30 inches in length, should reach maximum width of about 6 1/2 inches at a point 17 inches from the tip, and should taper to about 4 inches in width at the tip. The grip at the upper end should be "T" shaped to fit the thumb and finger grip and facilitate the "J" stroke. It should have a slight springy give in the water.

Where shallow water or stream and river canoeing is common, the blade must be wide at the bottom and perhaps a few inches shorter in length. While the stubby blade gives maximum bite at shallow stream depths, in lakes it also jerks the arms at the start of a deep water stroke, hence it is more fatiguing in deep water over a long period of time.

Some canoeists prefer the double bladed paddle, and great speed can be sustained this way for short distances. However, greater fatigue usually results over the long pull, and dyed-in-the-wool canoeists seem to be more satisfied with the single blade once the technique for its use has been mastered. Oars and outrigger rowing attachments are available from most canoe manufacturers, but space does not permit further description here.

OTHER EQUIPMENT

Because canoes 15 feet or longer can carry more than 800 lbs. with ease, comfort and sustenance are readily provided for extended trips into the wilderness. This should not mean that the wilderness traveler must carry the kitchen sink, for portaging and ease of paddling are also important considerations. Certainly, the canoe tripper will wish to consider taking the following minimum items when traveling into any part of the Yellowstone wilderness:

- -pack basket, rucksack, or other portable container that will keep food and personal items organized, and, if possible, off the very bottom of the boat
- -rain fly, poncho, or the like, to cover gear in case of wave spray or rain
- -spare paddle, canoe repair kit, length of light but stout rope, carrying yoke, sponge for bailing
- -flashlight, particularly when night travel is necessary
- -rain and wind protection while paddling (mustn't be restricting)
- -light mountain tent, sleeping bag
- -clothing to provide for below freezing temperatures any time of the year
- -insect repellent, dark glasses, sunburn protection
- -miscellaneous sports gear and personal articles
- -cooking gear, matches, portable grate, (if desired) collapsible water bucket, axe, shovel
- -life jackets or safety pillows

TECHNIQUE OF CANOE TRAVEL

Let's assume that two persons have obtained a 17 foot common aluminum canoe, two single bladed paddles and all necessary gear for a wilderness canoe trip. Here are some pointers which may be helpful in making such a trip more efficient, safe, and effective.

TRANSPORTING THE CANOE

Canoes are easily carried on car tops or in other boats. A heavy duty ski rack or standard boat carrying bars are suitable as supporting framework, but if such devices are used, the canoe should be anchored by extending a single rope from the ends to the radiator grill and the rear bumper. Two 2x6 boards cut more or less to the contour of the car roof and positively fastened to the car gutters by turnbuckles drilled to the gutters makes a more solid supporting frame. A further and simple variation is to throw two old tire carcasses on the roof, place the canoe on them, and firmly tie down both ends of the canoe to the car.

Canoes are also easily portaged by hand. A single person can throw a moderately light 18 footer over his shoulder by means of the center thwart and carry it single-handed for considerable distances. Carrying yoke pads installed on the thwart help prevent discomfort and give better control on steep grades and in strong winds. In general, a single man carry is easier than a two-man carry.

TRIMMING THE CANOE

Except when running with surf or rapids, it is most important that the cargo, both personnel and equipment, be arranged so as to allow the boat to ride with the bow very slightly raised. Heaviest items should certainly be placed along the bottom, and if the bow man is heavier than the stern man, cargo weight can be shifted so as to even out the discrepancy. Rain sheets can be placed over vulnerable parts of the load, and if the canoe takes on water provision should be made to elevate the load slightly from bottom

on cleats or by some other means. In order to provide greater and faster flotation in rough water, avoid loading the bow and stern areas heavily; place your heaviest gear amidship.

If there is but one occupant, the canoe should be trimmed to remain only slightly bow-high no matter where he may choose to paddle from. The popular misconception that the single paddler sits on the stern seat while the empty bow bounces up and down like a yo-yo above the water surface has lead to many a disaster. Granted, it is fun to cavort thus, it is infinitely more efficient to paddle from a position nearer the center of the boat. In solo canoeing I have found that by leaning against or sitting on the bow seat or thwart and paddling the canoe stern first, an ideal balance can be maintained, while the leading edge of the canoe is just slightly raised (enough to cut the ripples nicely). Because the paddler occupies nearly a pivotal position toward the center of the boat, strong winds do not tend to whirl the canoe around at will as it would if one end were appreciably lighter than the other. Further, the directional offset caused by a single paddle stroke is less.

LANDING AND EMBARKING

Improper entering and leaving a canoe often inflicts severe damage to it. The canoe should be carried to the water by two persons who face each other amidships on either side of the boat holding the gunwhales. The stern is then slid into the water using a hand over hand motion along the gunwhales, and the bow then lowered to the water's edge. While the bow man keeps the canoe in an upright position between his knees, the stern man, with sand washed from his feet, steps in and to the stern, sliding his hands along the gunwhales for balance and proper weighting, and assumes his paddling position. The bow man then steps in and moves amidship until the canoe floats and can be moved off shore; he then assumes his normal position.

It is proper to debark with the canoe either broadside to the shore or landing place, or, if shallow, perpendicular to it. Do not ram the boat up on shore. When the bow man steps out, he should immediately hold the canoe in the same position until

the stern man is out rather than try to pull the craft up on shore first as is often done.

While afloat, the bow and stern paddlers may change places safely, but care is needed. Both face each other, the bow man taking one step amidship and kneeling or sitting while his partner steps toward the bow and straddles him or steps beside him while sliding hands along the gunwhales. The kneeling man then can move to the stern position. Balance must be maintained in the exact center of the canoe, only one man moves at a time, and both should remain low.

PADDLING

The rudiments of paddling with a single bladed paddle can be learned in a few hours, but it usually takes years to become an expert, particularly from the stern or controlling position. In lake travel, the stern man is master of the ship, and customarily paddles on the side opposite to that of the bow man. Both occupants face forward and either sit on the regularly provided seat, or kneel on some sort of pad on the bottom of the canoe leaning back against seat or thwart. Slightly more leverage and stability can be achieved by the latter method and it is preferred by experienced canoeists, although it takes some conditioning to become used to the positions. A modification is to kneel on the paddling side and extend the opposite leg so as to help balance the canoe laterally to suit the individual. A kneeling pad is always advisable and is easily fashioned.

If a person paddles an unloaded canoe alone, he will usually sit just aft of amidship, for maximum efficiency, or directly amidship if quartering or facing a strong wind. To sit alone on the stern seat in an empty canoe is pure folly, but admittedly, it is fun.

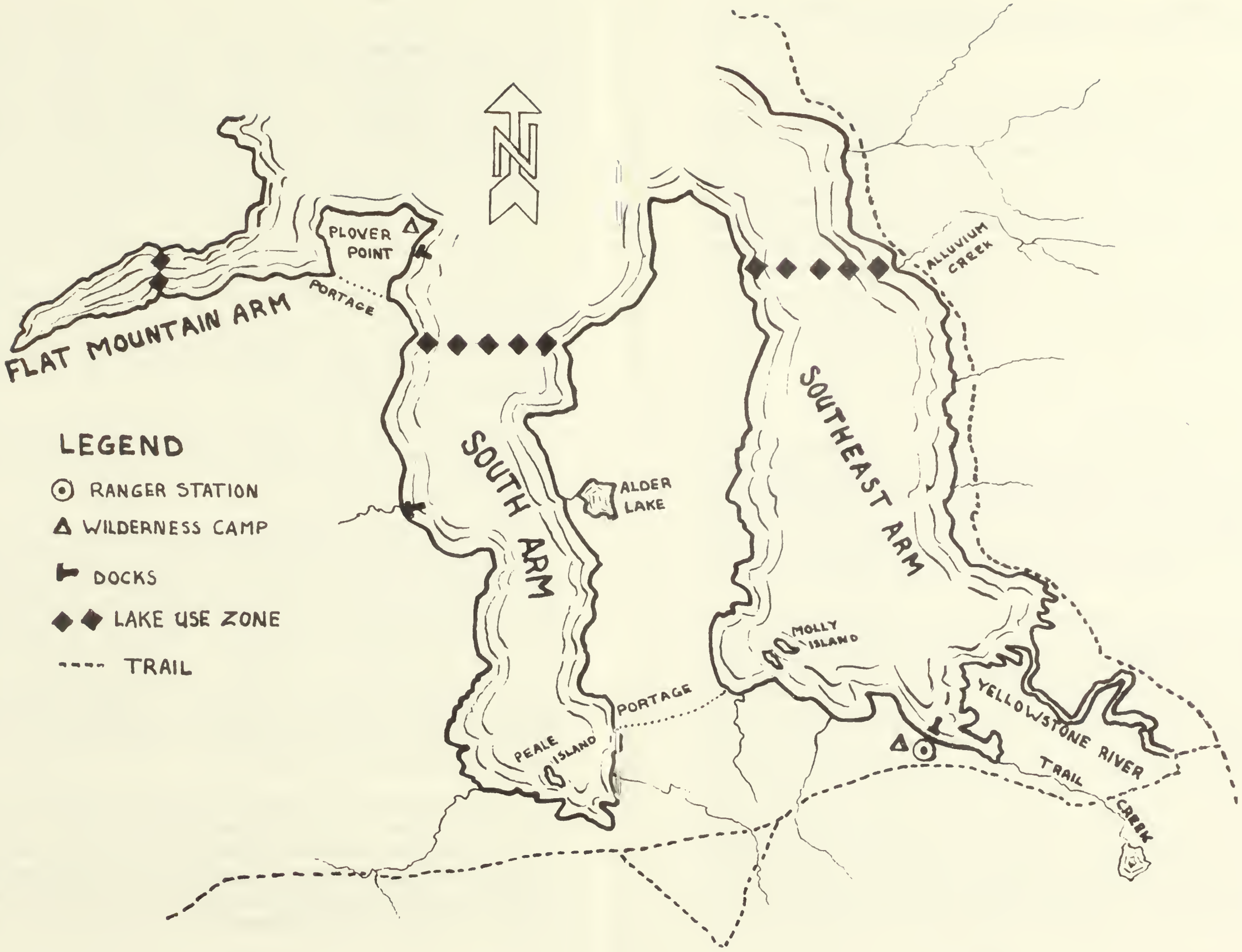
Stern and bow paddlers usually paddle on opposite sides, for the bow stroke partially compensates for the directional offset of the canoe caused by extra leverage from the stern paddling position. A favorable quarter wind can also be used to counteract side-thrust, but in any event, the complete control of this tendency is

ultimately achieved by the stern man through the use of the "J" stroke, or modification thereof. To do the "J" stroke, the stern man feathers the paddle blade slightly in mid-stroke and completes the movement by turning the thumb of his upper hand on the grip so that the inner edge of the blade turns toward the stern of the canoe with a slight outward thrust. The outward thrust is done with just enough force and duration to bring the canoe back on course at the completion of each stroke. For variety he may twist with a slight pry on the gunwhale, or he may draw the feathered blade back along side the boat "Indian style" on the recovery. With practice, good paddlers may feather the blade slightly in mid-stroke and do away with the terminal outward thrust of the "J". This also has the effect of preventing the canoe from veering and was named the "Pitch stroke" by Rutstrum. Mastery of the "J" stroke takes patience and many years' practice, but the novice can get along well enough after a few hours' practice. The single paddler applies the same principles.

Because of the extra time necessary for the stern man to apply the "J" stroke, the pace of the bow man is usually timed accordingly and in cadence.

If the bow paddler wishes to continue paddling while the stern man rests, it is just about impossible to keep the canoe on a straight course unless the stern man steers the canoe, using his paddle as a rudder. On the other hand, the bow paddler may cease paddling without undue effect except to slow the boat accordingly. The bow man, however, occupies an effective position to help steer the boat away from sudden obstacles, for by extending his paddle obliquely ahead of the canoe on either side, using the gunwhale to brace the hand holding the paddle shaft, he may effectively deflect the boat right or left.

Novices instinctively realize that the stern man can turn the canoe toward the right by paddling forward on the left side of the boat. The opposite reaction is experienced if the stern man backs water. By experimenting for a short time the combined actions of both stern and bow paddlers can achieve rapid pivotal movements which are handy when maneuvering in narrow places. Equally


LEGEND
RANGER STATION
WILDERNESS CAMP
DOCKS
LAKE USE ZONE
TRAIL
FLAT MOUNTAIN ARM
PLOVER POINT
PORTAGE
SOUTH ARM
ALDER LAKE
PEALE ISLAND
PORTAGE
SOUTHEAST ARM
ALLUVIUM CREEK
MOLLY ISLAND
YELLOWSTONE RIVER
TRAIL
CREEK

excellent resumes of paddle technique may be found in "The New Way to Wilderness" by Rutstrum (MacMillan Co.)

Not so simple is the art of moving the canoe broadside in either direction by the sculling action of the paddle (called feathering) along side the boat. By oscillating the paddle blade back and forth in small arcs and at the same time pulling in on the shaft but never quite letting the blade touch the gunwhale, or by pushing the blade away from the canoe using the same sculling motion in the opposite sense the canoe readily shifts laterally in either direction. This again takes skill and practice, and is one of those extras which the interested canoeist will wish to master after he has had the opportunity to become thoroughly acquainted with his craft. The canoeing merit badge booklet of the Boy Scouts of America contains excellent descriptions of various other strokes.

TRAVEL CONDITIONS

Wind and waves are the major obstacles confronting the lake canoeist. Wind can be combatted usually by steady paddling in a well trimmed canoe. Some paddlers find it effective to face a strong wind head-on. With the wind astern, care must be exercised to prevent advancing waves from slopping over the stern deck; possibly trimming the boat bow heavy would help in this instance.

It may be necessary for the canoeist to experiment momentarily to determine what course to follow when waves become threatening. Although a canoe could easily take a forty foot swell with a 200 foot wave length, choppy waves 2 feet high and less than 16 feet length may be enough to spill the beans. Under some conditions, quartering into the waves is an effective way to gain ground. When in doubt, land and wait it out! Winds on mountain lakes are erratic and cyclical over short periods. Particularly critical is the judgment of conditions "around the next point", and it is always advisable to keep a hasty landing place in mind should conditions around that point prove other than favorable for further travel. A little patience and farsighted care pays off. Beware also of the cross chop that is created by refraction, and reflection of waves

close to jagged points of land. More specific characteristics of various parts of Upper Yellowstone Lake are described later under the descriptions of each arm.

Although Yellowstone Park has few opportunities for safe or interesting white water canoeing, it may be important to know some of the fundamentals for it. When floating down a stream, once committed to a channel or a course of action there is little opportunity to back out; things happen fast. It is better to look over an apparently noisy and foamy rapids with an obvious steep drop than to hit it cold not knowing what is in store for you.

A boat moving in rapids or fast water can be controlled in direction only if its speed is relatively faster or slower than the current. The former is achieved by rapid and strong paddle strokes forward, the latter by backwater paddling. Since the backwater method allows more time for the choice of a course and is less conducive to severe bottom scrapes, it is perhaps the most frequently used technique in dangerous rapids. Persons running white water should remember to allow themselves enough freedom of position to spring clear of the canoe in case of upset, and should never let themselves be wedged between the canoe and an immovable obstacle in its path. Beware also of allowing the canoe to run broadside to the current if an obstacle is downstream.

Maximum stream turbulence and deepest water will be found near the outside of a meander curve; shallow water and relatively slow velocity can be expected on the inside of the curve. Where two streams join, differential water velocities are apt to occur, and if the canoe is caught between them, the resulting violent jerk usually causes an upset.

WILDERNESS CANOE TRIPS TO UPPER YELLOWSTONE LAKE AND SHOSHONE LAKE

The canoe is an ideal means for visiting the thrilling wilderness of Upper Yellowstone Lake, an area which has been set aside to enjoy without the clamor of mechanized devices which we have come to expect almost blindly on nearly every body of boatable water in the U. S. Here is a chance to experience the satisfaction of self sufficiency, to see and feel the country as the first explorers did. The person who takes such a trip into this water wilderness will never forget the exhilaration of this kind of living.

We hear that only the idle rich have the time and money to enjoy the waters of Upper Yellowstone Lake, but this opinion is easily refuted. A canoe is not an expensive craft, nor is it unreasonably expensive to be taxied to the mouth of any of the arms of the lake. By means of a small outboard motor (2-5 horsepower) mounted by simple bracket to the stern of a canoe, it is even practical to motor to the mouths of the arms from West Thumb, skirting the shore and exchanging motor for paddle when the wilderness boundary is reached. Neither is it impractical to paddle from West Thumb to the arms.

The notion that a canoe cannot be safely maneuvered by the average person on Yellowstone Lake is for the birds! Canoes have been safely if carefully used, on the Great Lakes, Long Island Sound, and other large bodies of water. If the wind becomes prohibitive, enjoy exploring the shoreline. If this means waiting until the moon comes up or even until four the following morning, it's all part of the game. If it means using one's judgment as to how to negotiate the next point or bay under existing wind and wave conditions, or in rain, sleet, or snow, this is the kind of thinking we practice too little! We thrive on the spirit of adventure, far from the push button, hot running tap water, and modern architecture. This is a worthy program for physical fitness which our country so desperately needs. If emergencies crop up, take them in stride. If serious threat to life or limb is involved, it is easy

enough to get in touch with persons who are assigned to patrol the area by the National Park Service.

To traverse all three arms, one should allow about 8 or 9 days, although segments of these bodies of water are fair game for weekend when time is limited. In calm water, or traveling before the breeze, two paddlers can count on making 4 miles per hour with ease.

During the travel season, each month has its distinctive advantage for canoeing on the arms, --the freshness of the early summer, the crisp, bug-free days of the last two weeks of August, the beginning of fall, all have their charms. No matter when we might take our trip, the primary weather element to contend with will be the wind, and we must plan our travel according to its behavior. The prevailing wind direction is from the southwest, meaning that in general, because of its orientation, Flat Mountain Arm will develop a good chop nearly every day,whereas the west shores of the other arms will generally remain calm enough for safe passage. However, any southward component of wind will tend to be diverted down the South and Southeast arms. Sudden changes in wind are to be expected, so the canoeist must remain adaptable. Except for lingering storms, it would be fairly safe assumption that, however rough the water during the afternoon, it will be calm enough at sunset for safe canoeing. This condition usually lasts until about ten or eleven the following morning. In other words, by traveling between the hours of sunset and forenoon the following day, the greatest distance can be made.

Any experienced seaman will tell you that the size of the wave developed depends upon the "fetch" or distance the wind has blown across a continuous expanse of water. The greater the fetch, the higher the wave under given wind conditions. This explains how a gale can produce 15 foot waves at the exposed mouth of an arm while simultaneously producing mere ripples on the leeward shore. It further brings out the importance of the so-called quarter mile limit, which prohibits small boats from straying farther than that distance from shore. In the case of the canoe, however, the most

interesting way to travel in any event is close to shore where one can watch the shoreline and bottom features as they come and go.

The broad-minded and sensible new policy which will allow parties in hand propelled boats to camp anywhere along the shores of the arms is certainly to be commended, for it eliminates the necessity for achieving certain landmarks and removes the pressure of concentrated use from certain designated areas. Through the cooperation of those who might go before, each party may have the feeling of establishing camp in their own virgin shoreline area, a rare privilege these days and one which cannot be abused! In order to maintain some feeling of adventure in this account, and to avoid the possibility of concentrated use, I shall refrain from mentioning more than a few pointers on the choice of campsites. In any event it will be necessary for each party to check in at the appropriate ranger station prior to a trip to obtain instructions and permits.

FLAT MOUNTAIN ARM

Though only about four miles in length, Flat Mountain Arm is a gem in its own right and should not be ignored by the canoe explorer if time permits the full traverse of the upper lake. Since it is elongate to the southwest, it is vulnerable to the prevailing wind and should be traveled just after sunrise for the most pleasant effect. Like the others, this arm shows the effect of glacial modification and gouging, but other geologic features are more evident to the eye along its shorelines. Its north shore is characterized by volcanic ash beds, lava flows with beady-eyed mineral crystals, and a conglomerate of non-locally derived roundstones. Springs emanate from the banks along this shore making camping a dubious venture. Toward its western end, the water becomes shallow and the aquatic bird life increases in abundance. If you like ducks, this is the place. One can take the shallow drafted canoe well up into the small inlet stream at the western extremity.

The south shore of Flat Mountain Arm shows the effect of tumbling landslides which spewed large rocks into the lake at

various times in the past partly in response to glacially oversteepened flanks of Flat Mountain. Saturation of the overlying plastic Morrison formation of Jurassic age by spring thaw waters, and earthquake shakings such as occurred in August of 1959, also trigger these landslips. Numerous beautiful little bays and bars along the east extension of this south shore provide many excellent camping places, but the concentration of campers along this shore in the past, increases the chances for visits by bear. It might be a good idea to consider anchoring one's perishables fifty feet or so from shore in the boat, or hoisting them on a high tree branch. But remember, bears can swim!

The large bay on the southeast extremity of Flat Mountain Arm takes the brunt of the afternoon wind, and if one were forced to spend time here, he might be interested in the series of bay bars, successively enclosing higher and more remote segments of the bay now dry. Progressive lowering of the lake level or silting of the bay could account for this phenomenon. If time were of the essence, it would be entirely feasible to portage the canoe through this neck into the South Arm, thus avoiding the necessity for skirting the exposed parts of Plover Point.

SOUTH ARM

From Plover Point the west shore of South Arm is a thrill a minute. Excellent camping spots, animal tracks in the sand, aquatic birds in abundance, sand pits and beautiful bays, little creeks, fields of flowers, browsing wildlife, all contribute to the natural scene. But the geologically minded will be fascinated by the boulders piled parallel to the shore but as much as 50 feet from water's edge. These are apparently thrust by expanding ice from the bottom of the lake during low level and could be considered classic examples of this phenomenon. Many of the thrust boulders weigh several tons, and nearly all are of volcanic origin, although undoubtedly secondarily borne by the glaciers.

The trip to the head of South Arm is climaxed at its southern extremity where the utterly charming sloughs, island, beaches,

and streams make ideal canoe country. Moose are abundant and may be observed eating aquatic plants close to pelicans, trumpeter swans, sand hill cranes, ducks, and geese. But as well as a canoe blends with the wilderness, it should not be pressed so close to these animals and birds that it unduly disturbs them, or even enlivens the possibility that mama moose might very well charge in shallow water.

The exploration of Grouse Creek is interesting, and a short hike along its banks leads westward to Outlet Channel, a gouged valley cut by glacial ice of the so-called Buffalo stage as it made its way southward toward the Jackson Hole country. Peal Island at the southern tip of the arm commands views in all directions and is fun to skirt. Housing here is for scientific study and the use of assigned patrol personnel, who incidentally are glad to have you stop by for a chat or to ask for information. The lower slough of Chipmunk Creek and its intricate anastomosing channelways are a must for the canoeist, and if needs be, the canoe can very readily be ported the scant mile from Chipmunk Creek to the end of Southeast Arm (see map).

Although vulnerable to the afternoon wind, the east shore of South Arm is an interesting paddle, and out toward the end of the peninsula known as the Promontory, good beach camping is possible. Alder Lake, on the way, is a mass of decaying algae in late August and the stench is unpleasant, but it is of scientific interest to the botanical enthusiasts.

SOUTHEAST ARM

Swinging around the Promontory, one enters another vast realm of water. It is worth the trouble to stop off and climb the Promontory, an easy half hour scramble, to survey the scene. It consists of the breccias, or broken rocks, now cemented together in the layered mass of numerous formerly soupy mud flows which originated on the slopes of the volcanic Absaroka Range to the east when these were more active in the geologic past. The vigor of storms and shoreline erosion has produced many bars and spits along the west shore, and strangely enough, the ice thrust features

so prominent along the corresponding shore of South Arm are here missing.

The southern end of Southeast Arm is the gem of Yellowstone Lake, for here the variety of things to see and do are endless. Paddling along the southwest end past broad meadows and scalloped bays with intriguing inlets, one can choose a number of camping spots that afford a good view of the famous Molly Islands, nesting ground for pelican, gull, cormorant, and tern. Field glasses are most useful for a closer look.

It is an easy paddle from the vicinity of Molly Islands to the protected bay of Trail Creek where the current organized campground is maintained. In late August, water is low enough to allow any number of excellent camping spots at the mouth of Trail Creek proper on the sand pits and swamp grass pads, where an unparalleled show goes on all day and night. Quiet unobtrusive activity here is well repaid by views of moose, elk, and other animals, and also the ever-present aquatic birds.

The Yellowstone River delta is a broad shallow area, about two miles wide, characterized by sandy spits, sloughs, spruce-lined channels, and, of course, the hidden but interesting Yellowstone River mouth itself.

The Beaverdam Creek campsite on the southeast side of this delta is a fine observation point to watch osprey and other diving birds catching fish in the shallow delta waters. Beaverdam Creek meadows stretching southward along the Yellowstone River is one of the finest wilderness meadows to be seen, and bull elk with their harems bugle loudly here late in the summer. The meadow is flanked to the east by the volcanic peaks of the Absaroka Range where good hiking and mountain scrambles are possible. Needless to say, fly fishing in Beaverdam Creek is usually good.

As far as canoe travel is concerned, the east side of Southeast Arm is a morning place, for the afternoon winds rake this shoreline. It is a beautiful mountain shoreline, though, and should be included in any complete itinerary. Brimstone Basin, the layers of volcanic breccias, petrified logs, and raised lake shore terraces add to the fascination of this particular area.

OLD FAITHFUL
DELACY CREEK
SHOSHONE
LAKE
MOOSE CREEK
LEGEND
ROAD
TRAIL
LAKE USE ZONE
LAKE
LEWIS
LAKE
SOUTH ENTRANCE
LEWIS RIVER

SHOSHONE LAKE

Park Naturalists Robert McIntyre and John Good have given us an idea of what it is like canoeing into Shoshone Lake. Devoid of sight, sound, and smell of mechanical devices, Shoshone Lake looks the same to today's adventurer as it did to the DeLacy party of miners who discovered it in 1863. Because it is far from the busy visitor centers of Yellowstone, Shoshone Lake is a sanctuary for animal and bird life, and one looks forward with a quiet excitement to rounding the next promentory knowing full well that something of value will be there.

The approach by canoe is from the road at Lewis Lake, thence 2 miles west along the lake shore and 3 miles north up the Lewis Lake channel to Shoshone proper. Although the last mile is a portage or hand line tow over the rugged stream bed to Shoshone outlet, paddling up Lewis River to this point is a most enjoyable experience. The river is deep and narrow at Lewis Lake, with no perceptable current, and the water so clear the canoe seems suspended in air.

It takes the average person about 4 or 5 hours to reach Shoshone Lake by canoe, depending on experience, load, weather, and the season of the year. Four days allotted to a trip around the lake is plenty of time to get a good idea of its wilderness values. In this amount of time you can visit the geyser basin at the extreme southwest end of the lake, a highlight of any trip. Incidentally, don't get too close to the geysers, for an unexpected eruption could result in a nasty burn. And don't forget your fishing rod! The big brown trout, lakers, and eastern brook trout that abound in Shoshone Lake provide thrilling battles the fisherman will not forget. Even if your time is limited, twelve hours will give you a solid sample of Shoshone, and the gay ride down Lewis River rapids, fast but not hazardous as rapids go, is a final thrill in a pleasant day.

Travel in Shoshone Lake involves the same safety principles as on Yellowstone Lake. The wind can kick up whitecaps at any moment, and the paddler will do well to plan his lake travel for early morning and late evening. Stay within 1/4 mile of shore,

camp only at designated and signed locations, and use trails where available. Above all else, use common sense; it is your protection. Remember, too, that maps of Lewis and Shoshone Lakes are available and included on the West Thumb and Lewis Lake Quadrangles.

With these few descriptive and cautionary words, point the bow north from Lewis Lake and away to miles of silent shore line. This unique water wilderness is too good to miss.

SAFETY

It would be a poor idea to start a canoe trip to the upper end of Yellowstone Lake or Shoshone Lake with such a precautionary attitude that we forfeit the freedom and thrill of adventure. Yet, one can enjoy being careful without shying from his own shadow. Canoeing ability is accrued with long experience, and situations often develop that demand careful judgment when canoeing high altitude lakes such as Yellowstone. For this reason, the canoe party should include at least one experienced person, if possible. The party should plan ahead so as to allow time to practice on small ponds before tackling Yellowstone, in order to learn the rudiments of the paddle stroke. They should practice maneuvering the boat and shifting position under relatively mild conditions.

In so far as the lake is concerned, two principle facts should be kept in mind; the water is cold, and sudden winds can whip up a violent surf within minutes. Physicians estimate that a capsized person can last but twenty minutes in the lake before becoming dangerously over exposed by the near freezing water temperatures just below the surface. This fact alone justifies the rule which requires boats shorter than 16 feet in length to be used within a quarter of a mile from all shores. If a canoe is capsized, passengers should hold on to the canoe, letting the water support their weight. By kicking steadily, it is an easy matter to bring the canoe ashore within a few minutes.

Wind-blown waves, of course, must be watched closely and judged as to their tendency to either swamp a canoe in one instant, or to slowly fill it with water by slopping over the gunwhales. When in doubt, land and wait it out!

Standing up, shifting weight, or shifting position is apt to make a person lose his balance and upset the canoe. One way to minimize these tendencies when moving forward or backward in a canoe is to support part of one's weight by placing the hands along the two gunwhales. This further prevents undue strain on the hull from the concentrated weight exerted through the feet. Looking through the view finder of a camera or through field glasses commonly causes loss of balance and must be done carefully.

By trimming the canoe properly, assuming the positions mentioned above, and avoiding extremes or sudden movements in any position, the danger of capsizing can be held to a minimum. Where two paddlers are concerned, any major shift of position should be prearranged by mutual agreement, be it ever so simple.

Never underestimate the true force of moving water, no matter how sluggish it seems to be. As some procedures for safely negotiating white water were mentioned above under the heading, Technique, they will not be repeated here.

Other dangers become more significant as the distance from help and medical facilities increases. These are the obvious dangers of which every camper is aware; use your axe carefully, don't get too close to the fire, beware of poor can openers, watch out for flying fish hooks, etc. In case help is needed, one of the quickest ways to attract attention is to build a smudge fire on the beach by piling green boughs on glowing embers. The standard woodsmen's distress signal, - three repeated whistles, shots, blows, or what have you, might be heard if the wind is calm.

Many are unaware of the danger from baiting or crowding certain game animals. Give moose plenty of room, particularly cow with calf, and if in doubt, look for the nearest climbable tree.

Primarily because of his scavenging carnivorous habits, the bear is often an unpredictable and dangerous pest, but certain procedures in camp may keep his visits to a minimum. Burn your tin cans to a crisp along with your garbage immediately after each meal, hang exposed foods high off the ground in a sack suspended from a tree, and by all means keep exposed food out of your tent or sleeping compartment. Bring out your cans. In some cases, storing food in an anchored boat well off shore is a determent though not a cure-all.

When traveling by foot through the woods or even in open places, steady chatter or other noise will help assure that bear will know where you are and thus will not be surprised. Grizzlies don't see very well, but will usually turn if they get your scent. It is generally assumed that grizzlies can't climb trees. But if you should be faced by an aggressive bear, don't turn and run headlong, but rather, slowly give way or detour, remembering that a hidden cub may be in the vicinity and may be the reason for all the fuss. Most small black bear can be discouraged by the thud of a boulder aimed near them, but don't press them! The smallest cub is pure fury at close quarters and can easily kill a person if the animal is panicked in a corner.

SUMMARY OF IMPORTANT SAFETY PRECAUTIONS:

1. All canoes, regardless of length, must stay within a quarter of a mile from all shores in Yellowstone Park.

2. Stay with a capsized canoe and swim it to shore.

3. Make your plans according to the predictable wind; be particularly alert to detrimental winds when coming around a point.

4. Trim the canoe for proper balance and "set" in the water. Leave a minimum of 6" freeboard amidship when loading.

5. Prearrange and carefully carry out any change of position in the canoe.

6. Apply the Golden Rule to the observation and treatment of wildlife.

7. Realize that small camp accidents may be serious at a great distance from help.

8. Know what your fire will do.

9. Check in at the designated Ranger Station for latest instructions, permits, and other pertinent information.

10. Maintain sanitary practices.

WILDERNESS AND YOU

Wilderness is a perishable commodity of which few are privileged to catch even a fleeting glance these days. The commodity grows dearer. To be able to live temporarily in a wilderness like that of the upper Yellowstone Lake area is an undeniable exciting and unique experience in an ever more crowded world. Although the upper Yellowstone Lake wilderness includes large tracts of land and water, its use will be concentrated along the points of access and the area most heavily used by the boaters will be a narrow strip of land along the lake shore not much more than 50 yards in width.

The broad-minded policy of the National Park Service in permitting the boater to camp where he wishes along shores of the upper lake should be treated with the utmost respect by the wilderness camper, and if the policy is to be maintained, it is obvious that each temporary camp must be left so undefiled that it would be impossible for a future camper to identify a former campsite. If the thrill and freedom of true adventure which we all crave is to be maintained, man must be but a fleeting shadow who blends

with this wilderness, enjoys it, and leaves it without his telltale mark. The wilderness flavor is not fully gained in a much used and populated public campground, and what's more, to be compelled to gain certain land marks in the face of wind and weather could be a discouraging aspect of any canoe trip. We want freedom! But we have to do the little voluntary chores to deserve it. It is up to you and me to do our part so that we can expect to find this wilderness and the experience of traveling in it as meaningful tomorrow as it is today.

The requirements for a good campsite will vary with the individual. Among my own personal considerations would be the following: mineral soil or sand for fire building, open space to prevent fire from spreading to overhanging boughs, dry ground not vulnerable to flooding during high winds, shelter from prevailing or expectable winds (unless wind is to be counted on to keep the bugs away) fire wood, a launching site, water (lake water is adequate for both drinking and other purposes at the time this is written), and a view.

Certain procedures around the campsite should be followed in the interest of wilderness manners. Burnable garbage should be completely incinerated in the fire, not thrown in the lake. Cans, likewise should be burned, smashed, and either buried or carried out. This procedure will assure that tin cans will rust and disintegrate, that they will not attract animals, and that they will not be a menace to man. Obviously, bottles must be brought out too.

If you have ever set your ground sheet or sleeping bag on a mass of charcoal you have realized the unpleasantness of this material. I have no real answer to the charcoal problem except to suggest that fires be held to a minimum and that ashes not be completely scattered when putting the fire out. A certain number of obvious fire sites will probably be used quite often, and if one were obliged to use an area where former fires had been built, it would be well to reuse the fire site rather than set up another one and increase the charcoal litter.

Fish entrails are best disposed of by burning, or by abandoning on the beach where the ever-present gull can use them for a meal; regulations prohibit throwing them into the water where they would sink to the bottom and rot unpleasantly. Cutting evergreen boughs for bedding, or cutting any standing tree is of course not only against regulations but creates an unforgiveable scar along the narrow beach strip. Bottles, bottle caps, kleenex, plastic covers or containers, and the like are items which our progeny a thousand years hence would consider disgusting artifacts. But the easiest way to ruin this area for our time is to let a fire get out of control. Build your fire on mineral soil, and when putting it out, douse it with water, digging it up and mixing the hot ash with the wet dirt. There's enough water available along the beach, so that should not be any problem. Touch it with your hand to see that no coals remain.

The everlasting problem of human waste disposal can be practically solved, and there is nothing quite so discouraging as to arrive at a spot where people have been inconsiderate in this respect. All that is necessary is to bury it deeply, and with a shovel, far enough from the lake shore or stream to assure it will not menace sanitation in the future.

A subtle aspect of wilderness manners is the consideration of the habitat of wild game and birds. We should not closely enter their sphere of operation, but should remain quietly on the side to do our observing. The wilderness enthusiast will understand very well that the Golden Rule applies here as well as in strictly human affairs.

If we are to fulfill the often expressed expectation that those who are willing to work physically to experience the wilderness will not unduly defile it, the above reminders may serve as a useful guide.

True woodsmen are made, not born. Park Rangers assigned to this area for duty, and other travelers, will be glad to help you. Good luck on your adventures in the Yellowstone water wilderness. Hope you will enjoy your trips as well as we have ours.

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